3.3 WATER

This section describes the existing conditions of the surface water and groundwater resources in the proposed project vicinity, evaluates potential impacts that the proposed project and alternatives could have on water resources, and presents recommended mitigation measures.

Several potential environmental consequences associated with the construction and operation of the Plymouth Generating Facility (PGF) have been identified. Construction activities associated with the proposed project could result in the discharge of sediment and other substances resulting in an adverse effect on surface water quality. Groundwater in hydraulic connection with the river could have an effect on beneficial uses of the river that depend on surface water flow. Wastewater and stormwater management, reuse, and disposal practices could have an adverse effect on groundwater quantity and quality. These potential impacts are described and evaluated in more detail below.

3.3.1 AFFECTED ENVIRONMENT

3.3.1.1 Regional and Site Area

The site area is defined for the purposes of this assessment as an area of approximately 532.5 acres around the plant site, as shown in Figure 3.3-1. This area extends south to Christy Road and includes the existing Plymouth Farm property, the lower portion of Fourmile Canyon, Christy Road, the Burlington Northern Santa Fe (BNSF) railway, and the existing Williams Northwest Gas Pipeline Company (Williams Co.) compressor station.

3.3.1.1.1 Surface Water

Precipitation

The closest regularly monitored National Oceanic and Atmospheric Administration (NOAA) precipitation data station to the site area is at McNary Dam approximately 5 miles east of the plant site. The period of record for this station is 1954 to the present. The average recorded annual precipitation at this location is approximately 7.85 inches (see Table 3.3-1). Precipitation distribution is typical for central Washington, with the majority of precipitation (rainfall and snowfall) occurring between October and March.

Surface Water Features

The site area lies within the drainage basin of the Columbia River, which is approximately 0.75 mile south of the plant site (see Figure 3.3-1) and flows westerly in the vicinity of the site area. Surface water flow in the Columbia River results from direct runoff of precipitation, groundwater discharge into the river, and runoff from snowmelt. Generally, periods of high flow correlate to periods of high snowmelt runoff in late spring. Along the Columbia River, dams

Table 3.3-1
Average Monthly Precipitation Summary[a]

Month	Inches Precipitation[b]
January	1.05
February	0.76
March	0.7
April	0.58
May	0.63
June	0.41
July	0.21
August	0.32
September	0.36
October	0.62
November	1.12
December	1.09
Total	7.85

[a] Based on period of record (October 1954 to December 2000)
[b] Precipitation data from NOAA station #455231, McNary Dam, Washington
Source: WRCC 2002

control the river's discharge through a series of reservoirs. The reach of the Columbia River adjacent to the site area is approximately 5 miles downstream of McNary Dam. Discharge data for the river at McNary Dam are available from 1950 to 1981 (subsequent discharge data were not readily available) (see Table 3.3-2). The average discharge at the data station, based on the 31 years of record, is 182,300 cubic feet per second (cfs). Average low flows are typically between 100,000 and 150,000 cfs, and typical average high flows are approximately 400,000 to 425,000 cfs (see Figure 3.3-2). Maximum flow recorded during this 31-year period was 798,000 cfs on June 2, 1956, and minimum flow recorded was 39,500 cfs on July 10, 1977. The period of low flow that occurs in fall and early winter is considered baseflow.

Minimum in-stream flow requirements were established by the Washington State Department of Ecology (Ecology) for the Columbia River basin in 1980 (Ecology 1998a, 1998b). The minimum instream flow requirements were developed to support extensive irrigation development, inland navigation, municipal and industrial uses, and hydroelectric power development of the Columbia River. Additionally, the anadromous fisheries of the Columbia River require minimum flows for their survival and special actions by agencies sharing in the management of the Columbia River. Flows on the river adjacent to the site area are subject to applicable minimum flow limitations for the river between John Day Dam and McNary Dam (River Mile 215.6 to 292.0). Flow requirements are presented in Table 3.3-2. Over the period of available data (1950 to 1981), the river did not meet minimum required flows for a total of 6 days.

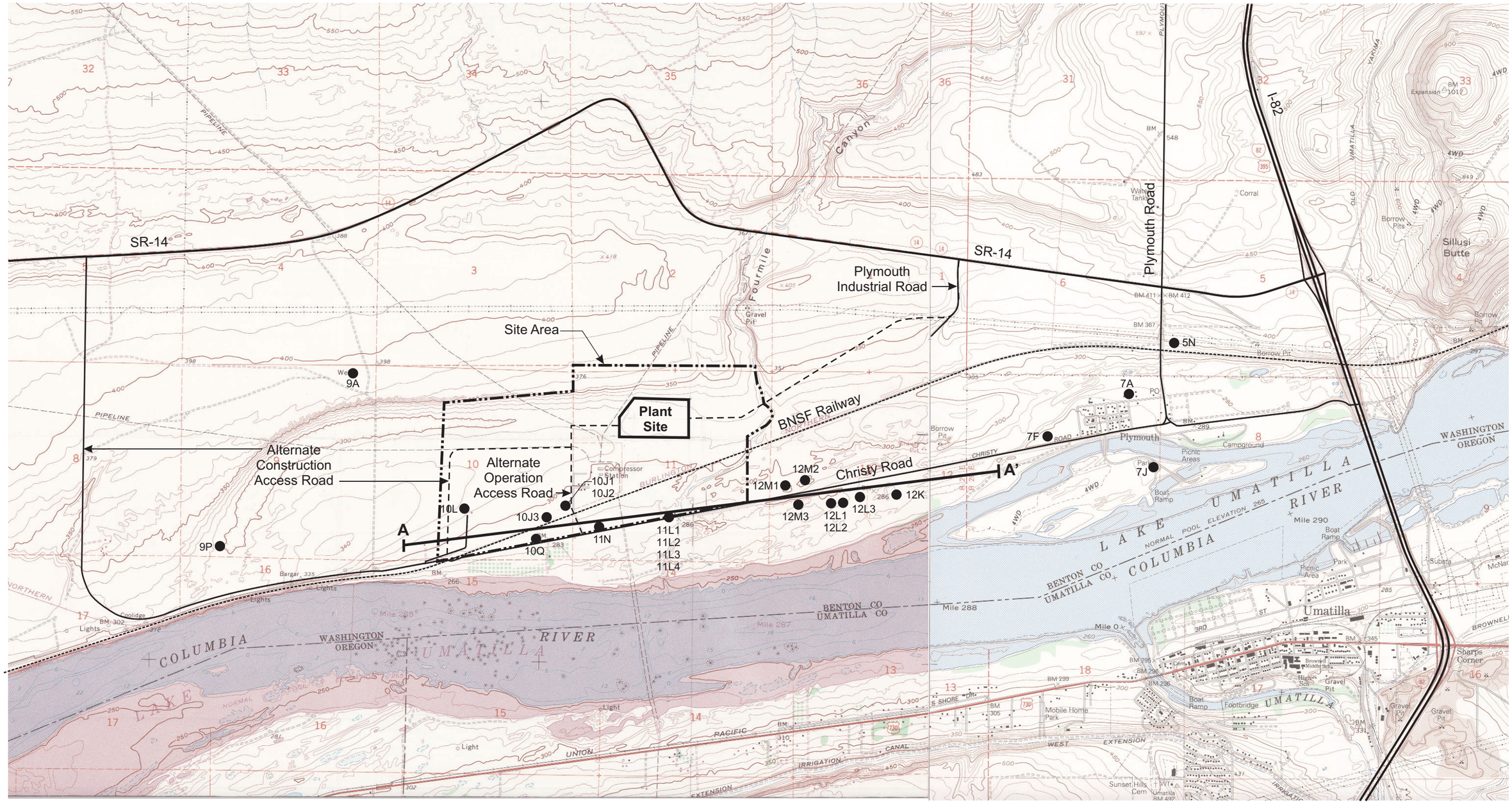

Figure 3.3-1

Site Area and Well Location Map

URS

Plymouth Generating Facility
Plymouth, Washington

Figure 3.3-1 continued

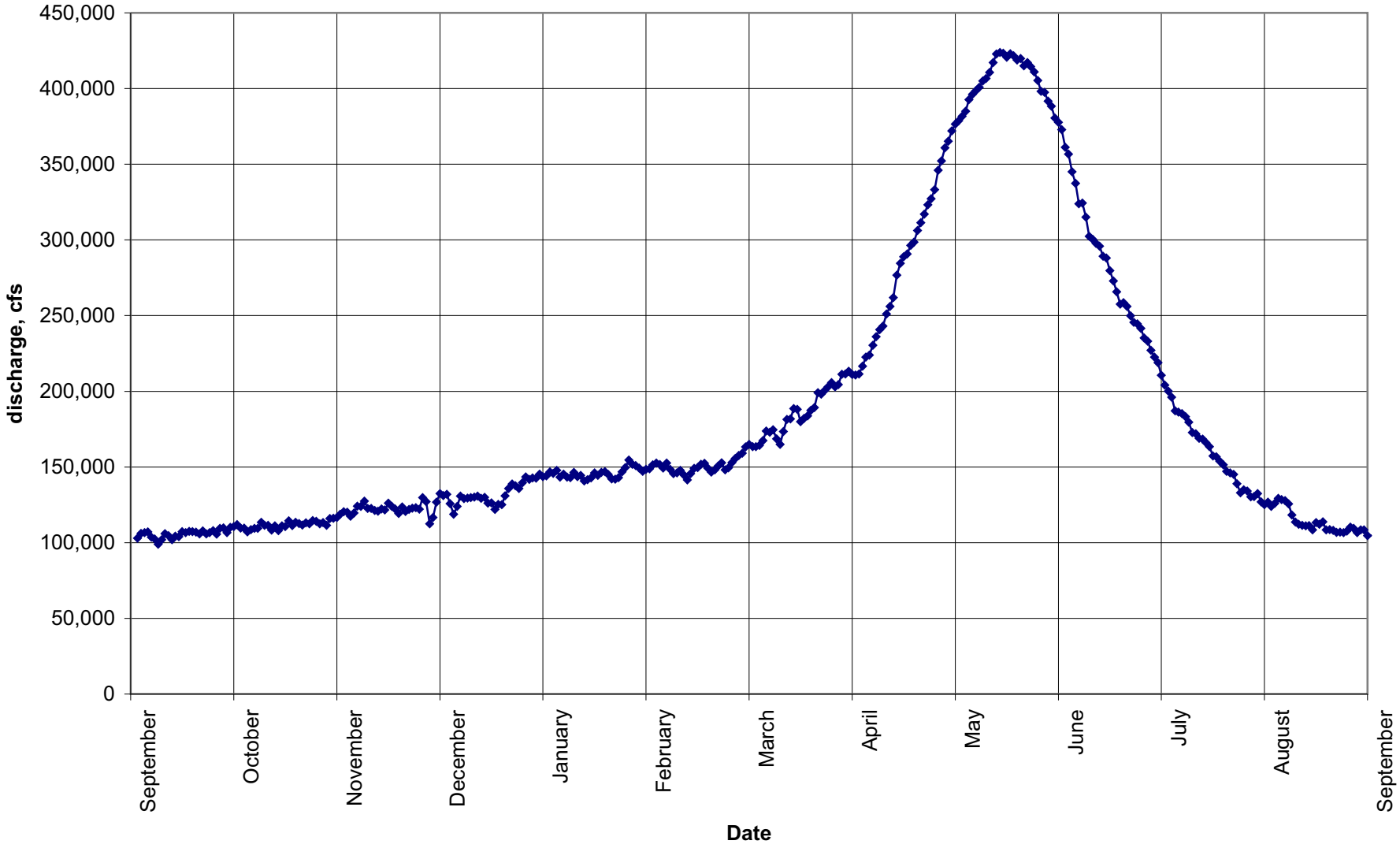

Figure 3.3-2

Daily Average Discharges (1951-1981), McNary Dam

Figure 3.3-2 continued

Table 3.3-2
Average Monthly Discharge Summary[a]
Columbia River at McNary Dam

Month	Average Discharge[b] (cfs)	Minimum Required Instantaneous Flow[c] (cfs)
January	134,500	20,000
February	146,300	20,000
March	152,700	50,000
April	192,900	50,000 (4/1-4/15)
		70,000 (4/16-4/30)
May	313,000	70,000
June	399,300	70,000 (6/1-6/15)
		50,000 (6/16-6/30)
July	252,100	50,000
August	145,400	50,000
September	109,700	50,000
October	106,300	50,000
November	112,300	50,000
December	123,300	20,000
Annual Average	182,300	

[a] Based on period of record (October 1950 to September 1981)
[b] Discharge data from USGS station #14019200 Columbia River at McNary Dam, Umatilla, Oregon
[c] Instream flows established by 173-563WAC (Ecology 1998a)
Note: cfs = cubic feet per second
Source: USGS 2002

The only other surface water feature in the site area is Fourmile Canyon. This intermittent drainage originates to the north and then flows south through the eastern portion of the site area (see Figure 3.3-1). Flow in this drainage is infrequent, and discharge and frequency data were not available. Fourmile Canyon is tributary to the Columbia River.

The site area is located on a relatively flat terrace of the Columbia River, and runoff, if present, is expected to drain to the south toward the Columbia River (see Figure 3.3-1). Periods of significant runoff are expected to be infrequent because of the limited amount of precipitation in the site area and the relatively permeable surficial soils.

An existing irrigation storage pond is located in the north-central portion of the site area. The pond is lined and is approximately 5 acres in area.

Flood Hazards

The Federal Emergency Management Agency completed a flood insurance study of the unincorporated portions of Benton County in 1982. According to this study, the plant site does

not lie within a 100-year floodplain. The nearest portion of the 100-year floodplain of the Columbia River is located within the site area approximately 0.5 mile south of the plant site. The other 100-year floodplain within the site area is Fourmile Canyon, which is located approximately 0.3 mile southeast of the plant site and would be crossed by the proposed access road.

Surface Water Quality and Use

The reach of the Columbia River adjacent to the site area is within Ecology's Water Resource Inventory Area (WRIA) 31. The Columbia River is classified as a Class A water source by Ecology (1997). Class A water quality meets or exceeds the requirements for all or substantially all uses, including water supply; stock watering; fish and shellfish rearing, spawning, and harvesting; wildlife habitat; recreation; and commerce and navigation. A summary table for water quality analyses from a sampling location near McNary Dam (see Appendix C) shows parameters to be generally within applicable standards, with a few exceedances for temperature, dissolved oxygen, pH, and turbidity.

Individual sampling locations on the Columbia River between John Day Dam and McNary Dam are on Ecology's 303(d) list. This list compiles water body segments that do not meet applicable water quality standards after implementation of technology-based controls (e.g., septic systems or water treatment) (Ecology 2002a). Excursions above these standards for samples collected from the river between the site area and McNary Dam included temperature, total dissolved gas, and dioxins. The list did not include specific discussions regarding the causes or frequency of these excursions, or of potential actions regarding these excursions.

3.3.1.1.2 Groundwater

Groundwater Occurrence and Flow

The aquifers supplying groundwater to wells in the site area consist of unconsolidated alluvial deposits within valleys incised into the underlying bedrock of the Columbia River basalts and permeable zones within the basalts. The unconsolidated deposits consist primarily of glacial alluvium deposited by Pleistocene glacial outburst floods, as well as surficial deposits of loess wind deposits (WDNR 1994). See Section 3.1, Earth, for more details on the geology of the site area. The two aquifers are present in the site area and are described below.

Unconsolidated Aquifer

The uppermost (shallow) aquifer is an unconfined, high-transmissivity alluvial deposit adjacent to the Columbia River (USGS 1999; Ecology 2002c). In the site area, the unconsolidated aquifer is bounded on the south by the Columbia River and at the base and to the north by basaltic bedrock. Wells in this aquifer vary in depth, but are typically between 30 and 90 feet deep (see Figure 3.3-3). Depth to groundwater in these wells is reported to be between approximately 20 and 65 feet below ground surface (bgs). Recharge to the aquifer is primarily through infiltration from the Columbia River, as well as infiltration of precipitation and irrigation water. Near the Columbia River, the aquifer has been designated by Ecology as being in direct hydraulic continuity with the river (Benton County 2000). Quantification of the hydraulic